

## 8

Claims

1. A method of preparing expanded thermoplastic microspheres, comprising the steps of:
  - (a) charging thermally expandable microspheres into an expansion device comprising
  - 5 rotating feeding means enveloped by a hollow body, and one or more scrapers preventing layers of microspheres being built-up in the expansion device,
  - (b) transporting the microspheres through the expansion device while increasing the temperature of the microspheres to achieve expansion thereof, and,
  - (c) discharging the microspheres.
- 10 2. A method according to claim 1, wherein said one or more scrapers are positioned between the outer radius of the feeding means and the inner surface of the hollow body.
3. A method according to claim 1, wherein said one or more scrapers are mounted on the feeding means and extend radially beyond the outer radius of the feeding
- 15 means towards the inner surface of the hollow body.
4. A method according to claim 1, wherein said one or more scrapers, alone, or in combination, effect a scraping of from about 20 to about 95 % of the longitudinal length of the inner surface of the hollow body.
5. A method according to claim 1, wherein one or two scrapers effects a
- 20 scraping of from about 70 to about 100 % of the longitudinal length of the inner surface of the hollow body and 2 to 4 scrapers effect a scraping of from about 10 to about 40 % of the longitudinal length of the inner surface of the hollow body.
6. A method according to claim 1, wherein said one or more scrapers are mounted on the feeding means starting at the inlet side of the expansion device and
- 25 extending therefrom.
7. A method according to claim 1, wherein said one or more scrapers, or a surface layer of said one or more scrapers, are/is made of a fluoroplastic material.
8. A method according to claim 1, wherein the hollow body is provided with one or more heaters.
- 30 9. A method according to claim 1, wherein the thermally expandable microspheres are pre-mixed, before entering the expansion device, with a filler preventing agglomeration of the microspheres.
10. A method according to claim 9, wherein the filler is silicon dioxide.
11. A method according to claim 10, wherein the weight ratio added filler to
- 35 microspheres is from about 1:100 to about 1:3.
12. A method according to claim 1, wherein the thermally expandable microspheres have a dry solids content of more than about 97 weight %.

13. A method according to claim 1, wherein the feeding means is in the form of a screw.

14. A method according to claim 1, wherein the feeding means is in the form of one or more paddles protruding from a central core.

5 15. A method of preparing expanded thermoplastic microspheres, comprising the steps of:

(a) pre-mixing thermally expandable microspheres with a filler preventing agglomeration of the microspheres,

10 (b) charging the microspheres into an expansion device comprising rotating feeding means enveloped by a hollow body, and one or more scrapers preventing layers of microspheres being built-up in the expansion device, said one or more scrapers, alone, or in combination, effect a scraping of from about 20 to about 95 % of the longitudinal length of the inner surface of the hollow body, the hollow body is provided with one or more heaters,

15 (c) transporting the microspheres through the expansion device while increasing the temperature of the microspheres to achieve expansion thereof, and,  
(d) discharging the microspheres.

16. A method according to claim 15, wherein the feeding means is in the form of a screw.

20 17. A method according to claim 15, wherein the feeding means is in the form of one or more paddles protruding from a central core.

18. An expansion device for preparing expanded thermoplastic microspheres comprising rotatable feeding means enveloped by a hollow body, and one or more scrapers positioned between the outer radius of the feeding means and the inner surface  
25 of the hollow body.

19. An expansion device according to claim 18, wherein said one or more scrapers are mounted on the feeding means and extend radially beyond the outer radius of the feeding means towards the inner surface of the hollow body.

20. An expansion device according to claim 18, wherein said one or more  
30 scrapers, alone, or in combination, effect a scraping of from about 20 to about 95 % of the longitudinal length of the inner surface of the hollow body.

21. An expansion device according to claim 18, wherein one or two scrapers effects a scraping of from about 70 to about 100 % of the longitudinal length of the inner surface of the hollow body and 2 to 4 scrapers effect a scraping of from about 10 to about  
35 40 % of the longitudinal length of the inner surface of the hollow body.

10

22. An expansion device according to claim 18, wherein said one or more scrapers are mounted on the feeding means starting at the inlet side of the expansion device and extending therefrom.

23. An expansion device according to claim 18, wherein said one or more scrapers, or a surface layer of said one or more scrapers, are/is made of a fluoroplastic material.

24. An expansion device according to claim 18, wherein the hollow body is provided with one or more heaters.

25. An expansion device according to claim 18, wherein the feeding means is provided with one or more heaters.

26. An expansion device according to claim 18, wherein the feeding means is in the form of a screw.

27. An expansion device according to claim 18, wherein the feeding means is in the form of one or more paddles protruding from a central core.